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MEMORANDUM

To: Eric Blischke

From: Windward Environmental LLC

Subject: Supporting Information for Benthic Risk Evaluation

Date: November 18, 2009

On October 2, 2009 EPA requested the following supporting information for the benthic risk evaluation, which should be provided electronically as spreadsheet files.

- Task 1: Output FPM files for the optimal solution for each bioassay test and for both the low and high screening levels. We recognize that these will be large files.
- Task 2: A table showing the results of all runs for each bioassay test using the range of false negative values.
- Task 3: A table of potential SQG values (for both low and high screen) from which the lowest one was selected.
- Task 4: The FPM files showing the calculation of reliability results using the pooled dataset for the selected SQG values.
- Task 5: A table showing the reliability results using the pooled dataset for the national sediment screening values.
- Task 6: It would also be helpful to have the FPM files for the runs prior to removing about one dozen chemicals to create the final chemical list.
- Task 7:The formulas for calculation of reliability should be included (as well as specifying how the reliability for each low/mod/high thresholds were calculated).
- Task 8:The LRM results should be provided, including all models developed, the number of samples used in model development, and the normalized chi-square goodness of fit.

- Task 9: Document classification of samples as PYO and PTO. Is there an analysis to support this that has been distributed or a list of samples with the classification?

The data deliveries for the different tasks are summarized below and definitions of all acronyms and file name abbreviations are presented at the end of this memo.

- **Task 1:**
  - Folder "Task 1 files.zip" - 26 output FPM files are provided to document the optimal solution for each bioassay test. The different runs are categorized by 2, 3, and 4 or refine or refine test.
- **Tasks 1, 2, 3, 4**:
  - The file "Task 1, 2, 3, 4 - Documentation_for_EPA.zip" provides the requested information for the four tasks as well as some additional information. The file is organized as follows:
    - Tab 1 – data screen – Initial data screen for # detects, differences between mean concentration of hit and no hit locations
    - Tab 2 – Anova results - results of the Anova test,
  - **Task 2:**
    - Tabs 3-11 - FPM runs for each endpoint showing results of the three types of runs (20% false negative values only, a range of false negatives, and the minimum SQG from the range)
    - Tab 12 – endpoint summary – consolidates information from tabs 3-11.
  - **Task 3:**
    - Tab 13 – calc hilo sqvs- calculations of the minimum SQGs for low and high risk endpoints
    - Tab 14 – organize hilo – puts chemicals into groups based on SQGs and AETs
    - Tab 15 – lohisummary – values from Tab 14
    - Tab 16 – endpoint_sqgs – value summary of endpoint specific SQGs – no other info
    - Tab 17 – aroclors_congeners – relationship between Aroclor and congener concentrations
  - **Task 4:**
    - Tabs 18 and 19 – pooled hi, pooled lo - SQGs for pooled high and low toxicity thresholds

  - Tab 20 – FINAL SQGs POOLED ENDPOINTS - final SQGs selected for the pooled endpoint,
  - Tab 21 22 – hi sqg set tests, low sqg set tests – results of runs removing different groups of chemicals to see effects on FP and FN rates
  - Tabs 23, 24 – high hit no hit, low hit no hit – chemical concentrations of hit/no hit locations for pooled endpoints
  - Tabs 25, 26 – 9_09_rerun, 9_09_rerun_summary – September rerun using section of FPM Calc workbook that allows determination of necessary chemicals. Summary shows final list of chemicals that were needed to make the model work.

- **Task 4:** The folder "Task 4 files.zip" includes two Excel files of FPM model runs
- **Task 5:** The file "Task 5 generic SQGs.xls" provides the false negative and false positive information for the generic SQGs, mean quotients, and ESBs.
- **Task 6**: The subdirectory "Task 6 reduced chem. list.zip" includes six different FPM runs with reduced chemical lists.
- **Task 7**: The file "Task 7 reliability statistics.xls" provides the reliability definitions used in the modeling effort.
- **Task 8:** The subdirectory "Task 8 LRM results summary.zip" includes one file with the requested LRM information. The file is organized as follows:
  - Tab 1 notes describing the model runs,
  - Tab 2 LRM summary of results,
  - Tab 3 summary of toxic station screened out,
  - Tab 4 reliability results,
  - Tab 5 cross tab of best hit predictors.
- **Task 9**: The file "Task 9 PYO-PTO data.xls" provides the pyrogenic and petrogenic classifications of the bioassay stations used in the modeling effort.

Acronyms and abbreviations

Calcasieu BERA REV	CALBERA
calc	calculation
ch and chr	*Chironomus*
chg	*Chironomus* growth (biomass)
chs	*Chironomus* survival
ESB	equilibrium partitioning sediment benchmark
EPA	US Environmental Protection Agency
fn	false negative
fp	false positive
FPM	floating percentile model
g	growth/biomass
hi	high toxicity thresholds
hy and hya	*Hyalella*
hyg	*Hyalella* growth (biomass)
hys	*Hyalella* survival
L2	Level 2 (Significantly different from negative control (one-sided t-test, alpha=0.05) and 0.9*REV > mean negative control-adjusted response $\geq$ 0.8*REV).
L3	Level 3 (Significantly different from negative control (one-sided t-test, alpha=0.05) and 0.8*REV > mean negative control-adjusted response)
lo	low toxicity thresholds
LRM	logistic regression model
m	mortality
NNO	nonionic organics
PAH	polycyclic aromatic hydrocarbon
pool	pooled endpoint
PTO	petrogenic
PYO	pyrogenic
ref env	reference envelop
REV	reference envelop value
screen	screening run
sqg	sediment quality guideline
sqv	sediment quality value
tox	toxicity